

Extended Reality

What is it?

Extended Reality (XR) is an umbrella term for technologies that blend physical and digital experiences with varying levels of immersion, from providing information while you work to interacting with objects in a fully virtual environment.

Assisted reality delivers information while keeping your hands and sightline free, while augmented reality (AR) overlays graphics or content onto the world around you as you move through it.

Mixed reality (MR) goes further, allowing you to interact with 3D digital objects in the space around you as though they were really there. Virtual reality (VR) provides full immersion, replacing your surroundings with a computer-generated 3D environment.

For manufacturers, XR can support everything from design and training to installation, maintenance and sales. The right combination of hardware and software depends on the task.

Why it matters

Manufacturers are under constant pressure to improve productivity, reduce costs and make the most of their people and expertise. XR offers practical ways to tackle these challenges by removing physical barriers to how businesses design, train, collaborate, sell and support their operations. For example:



- Products can be reviewed before physical prototypes are made.
- Engineers can access specialist support without another expert travelling to site.
- Employees can receive instructions while carrying out a task.
- Customers can experience products without them being physically present.

For SMEs, these capabilities can translate into tangible benefits:

- Less travel and downtime.
- Lower prototyping and training costs.
- Faster decision-making and better use of specialist skills.

Crucially, XR can make expertise more accessible, allowing knowledge to be shared with the people who need it, wherever they are.

What it enables

XR can help manufacturers overcome physical barriers, making it easier to share knowledge, collaborate, develop skills and interact with products, processes and information in new ways.

-  **Productivity** – Helps people complete tasks faster and with the right information at the point of need
-  **Efficiency** – Streamlines processes, reducing wasted time, travel, resources and repeat visits
-  **Collaboration** – Enables teams and experts in different locations to work together in a shared virtual environment
-  **Skills** – Supports immersive training, on-the-job learning and knowledge transfer
-  **Innovation** – Enables ideas, products and processes to be explored virtually before committing to prototypes or production
-  **Customer experience** – Brings products and concepts to life without them being physically present
-  **Expertise** – Makes specialist knowledge accessible wherever and whenever it is needed
-  **Safety** – Allows complex or hazardous tasks to be practised safely using virtual equipment, building competency before working in real environments.



Where it works

Practical applications to help you see where XR could add value in your business:

Virtual prototyping and product development
Enables teams to review and interact with 3D designs directly from CAD before making physical prototypes, helping identify issues and speed up decisions.
Factory and work cell planning
Visualises layouts, equipment and workspaces before making changes, helping assess workflow, access, ergonomics and safety.
Virtual installation and commissioning
Places full-scale digital models into real environments to test fit, access and serviceability before installation.
Training and work instructions
Provides immersive learning, safe simulation and step-by-step guidance, helping employees develop skills and access knowledge while they work.
Maintenance and field service
Gives engineers information and access to remote expertise at the point of need, helping solve problems and reduce repeat visits.
Site surveys
Captures data, images and observations hands-free, improving the efficiency and accuracy of surveys.
Sales and demos
Allows customers to experience virtual products at full scale, bringing large or complex equipment to life without the cost and logistics of physical transportation.

How it works in practice

XR brings together hardware, digital content and data to give users the right level of immersion for the task.

-  **Devices** – Smart glasses, headsets, tablets or smartphones allow users to view and interact with digital content.
-  **Content** – Instructions, images, video, 3D models and simulations can be presented virtually or overlaid onto the physical world.
-  **Interaction** – Users can follow workflows, explore designs, manipulate virtual objects, practise tasks or connect with remote experts.
-  **Data** – Existing CAD models, technical information and work instructions can provide the content, while connected systems can potentially deliver live information at the point of use.

The technology can range from simple visual or voice prompts to fully immersive 3D environments, depending on the application and chosen device.

Case study snapshots

“XR can reduce unnecessary prototyping, improve customer collaboration and provide greater confidence in design decisions.”
Addlux, a lighting manufacturer, worked with Made Smarter to explore XR, enabling customers to visualise proposed solutions and see how they could perform in different environments before physical prototypes are made.
“Capturing conversations and physical observations hands-free has significantly reduced errors and eliminated the need for duplicate follow-up visits.”
R&B Industrial, an Andover manufacturer of dust extraction and ventilation systems, is deploying ATEX-certified RealWear headsets to record site visits hands-free, with plans to expand their use for technical guidance and remote expert support.

Key considerations

Before investing in XR, consider the task, working environment and people who will use it. The most immersive technology isn't necessarily the most effective.

- Business need** – Identify the problem you want to solve and where XR could add measurable value.
- Level of immersion** – Choose the technology that best suits the task. Full immersion isn't always necessary.
- Safety and usability** – Consider sightlines, hands-free working, comfort and the environment where it will be used.
- People and skills** – Involve employees early and consider the skills and support needed for successful adoption.
- Content and data** – Assess existing assets, including CAD models, work instructions, images, video and digital information.
- Infrastructure** – Consider connectivity and how XR will work with existing systems and processes.
- Value** – Define success and how improvements in time, cost, quality or productivity will be measured.

Common pitfalls to avoid

- Choosing XR technology before defining the business problem.
- Assuming the most immersive technology is always the best solution.
- Trying to do too much with the first project.
- Failing to involve employees who will use the technology.
- Overlooking how XR will fit with existing systems and processes.
- Failing to define success and measure the value delivered.

6 steps to success and how Made Smarter can help

1

Identify the opportunity – Start with a clear business challenge or area for improvement, such as training, design, maintenance, field service or customer experience. This helps identify where XR could add practical value.

MADE SMARTER SUPPORT:
Digital Transformation Workshop

2

Align with business goals – Ensure the opportunity supports wider priorities such as productivity, cost reduction, skills, innovation or growth.

MADE SMARTER SUPPORT:
Digital roadmap development

3

Explore and test – Assess the different XR options and levels of immersion, and trial solutions where possible before making larger investments.

MADE SMARTER SUPPORT:
Technology Adoption Specialist (TAS), Digital Internship and proof-of-concept support

4

Build skills and confidence – Involve employees and develop the knowledge and capability needed to adopt XR successfully.

MADE SMARTER SUPPORT:
Leadership and Digital Champions programmes

5

Develop a business case – Understand the potential benefits, costs, practical requirements and operational impact before investing.

MADE SMARTER SUPPORT:
TAS support, Grant funding application

6

Invest and scale – Implement the solution, measure its impact and expand what works across the business.

MADE SMARTER SUPPORT:
Grant funding

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**Take the
next step**

Start your digital journey today. Register for support and speak to a Made Smarter adviser to explore how XR could support your business.